



The effect of feeding with spoon and bottle on the time of switching to full breastfeeding and sucking success in preterm babies

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Abstract

Aim: This research was conducted to determine the effect of the feeding methods of spoonfeed and feeding by bottle on the time of switching to full breastfeeding and sucking success.

Material and Methods: The study was conducted between September 2013 and January 2014 at the primary level of the neonatal intensive care clinics in two hospitals found in the eastern region of Turkey in a comparative and descriptive fashion. The population was composed of preterm babies who received treatment and care in these clinics during the period when the study was conducted and who met the criteria of the investigators. Without selecting the sample group the whole of the population was studied. The study was conducted with 37 preterm babies who were spoonfed and 35 preterm babies who were fed by bottle. The data were collected with “information form introducing preterm baby”, “follow-up form for preterm baby” and “LATCH Breastfeeding Assessment Tool”. The data were evaluated using percentage distribution, mean, chi-square test, t-test in independent groups, Cronbach alpha coefficient and McNemar analysis. Ethics committee approval was obtained from Atatürk University Faculty of Health Sciences (dated 08.05.2013) and official approvals were obtained from the related hospitals to conduct the study.

Results: A significant difference was found between the mean times of switching to full breastfeeding from the first breastfeeding in preterm babies in the spoonfed group and bottle fed group in favour of the spoonfed group ($p<0.05$). No significant difference was found between the two groups in terms of starting breastfeeding, switching to full breastfeeding, the mean weights at discharge and the mean times of discharge ($p>0.05$). While no significant difference was found between the groups in terms of mean LATCH scores measured initially ($p>0.05$), the mean scores in the spoonfed group at the second and final measurement were found to be statistically significantly higher ($p<0.05$).

Conclusions: It was found that the preterm babies in whom spoonfeeding was used as a supportive method in addition to breastfeeding switched to full breastfeeding in a shorter time compared to the babies who were fed by bottle and their sucking success was at a better level. (Türk Ped Arş 2014; 49: 307-13)

Key words: Feeding by bottle, sucking success, preterm baby, spoonfeed, full breastfeeding

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Introduction

For preterm babies to achieve an efficient and safe oral feeding, they should have coordination of sucking, swallowing and breathing (1, 2). In preterm babies who are initially fed by gavage, feeding by gavage should be stopped as soon as possible when this coordination is achieved and oral feeding should be started by breastfeeding (3-7). However, preterm babies are not very successful in nursing in their first experience on the breast. Therefore, other supportive feeding methods including bottle-feeding, feeding with spoon, dropper and pot and finger-feeding may be required in addition to breastfeeding until the babies can meet their nutritional needs by nursing (3, 8). In the literature, there are different results related with these feeding methods (9-11).

This study was planned to investigate the effect of feeding with spoon and bottle on the time of switching to full breastfeeding and sucking success.

Material and Methods

The study was conducted between September 2013 and January 2014 at the primary level of the neonatal intensive care clinics in two hospitals found in the eastern region of Turkey in a comparative and descriptive fashion. The population was composed of preterm babies who received treatment and care in these clinics during the period when the study was conducted and who met the criteria of the investigators. Without selecting the sample group the whole of the population was studied. In the strength analysis performed, the strength of the study was found to be 0.72 with a margin of error of 0.05 at a confidence interval of 95% when 35 preterm babies were included in each study group (12).

Study group selection criteria

Preterm babies

- Who were at the 30-34th gestational week,
- Who had a birth weight of 1000 g or above,
- Who had an Apgar score of >6,
- Whose health status was stable (who had no congenital malformation which could lead to asphyxia and affect breathing, who had spontaneous breathing, who had no hyperbilirubinemia which

could lead to exchange transfusion and who had no cranial bleeding),

- Who were fed only by gavage with breastmilk and ready to switch to oral feeding,
- Whose mothers were willing to nurse were included in the study.

In collection of the data, the “information form introducing the preterm baby”, preterm baby follow-up form” and “LATCH Breastfeeding Assessment Tool” developed by the investigator in the light of the related literature (9, 10, 13) were used. The “information form introducing the preterm baby” which was prepared by the investigator in the light of the literature was filled in by face to face interview technique. Information which could not be obtained from the family were obtained from the patient file. The preterm babies hospitalized in both neonatology clinics were started to be followed up from the time of the process of switching from enteral feeding to oral feeding. The information obtained during this follow-up period were recorded in the preterm baby follow-up form.

LATCH is a scale which defines the sucking success of the baby and the validity study of its Turkish translation was performed. Each item in this scale is evaluated between 0 and 2 points. The lowest score is 0 and the highest score is 10 (14-16). Higher scores indicate high sucking success. In this study, the LATCH Breastfeeding Assessment Tool Cronbach alpha coefficient was found to be 0.81. The study data were collected by the investigator. However, the LATCH form was filled in by the investigator and an observer, since it was an observation-based form. The preterm babies were evaluated by the investigator and an observer at the same time independently from each other at the time of the first breastfeeding, after 24 hours and at the time of discharge. The compatibility between the independent observers was evaluated with McNemar test and it was found that there was no difference between the observers ($p>0.05$).

In one of the clinics where the study was conducted, feeding with spoon was used as an additional supportive feeding method for preterm babies who switched from feeding by gavage to oral feeding (breastfeeding) and feeding by bottle was used in the other.

Spoon feeding group: The babies were initially nursed by their mothers at oral feeding meals by clinical practice. Afterwards, the babies were fed with the amount of breastmilk (previously nursed by the mother) ordered by the physician with spoon feeding method.

Bottle feeding group: The babies were initially nursed by their mothers at oral feeding meals by clinical practice. Afterwards, the babies were fed with the amount of breastmilk (previously nursed by the mother) ordered by the physician with bottle feeding method.

For the study to be conducted approval was obtained from the Atatürk University Health Sciences Faculty ethics committee and formal approval was obtained from the related hospitals. The families of the babies were interviewed and informed consent was obtained after making the necessary explanations. The data obtained as a result of the study were analysed using Statistical Package For Social Sciences (SPSS, Inc., Chicago, IL, USA) version 18.0 with percentage distribution, mean, chi-square test, independent t test, Cronbach alpha coefficient calculation and McNemar test.

Results

When the preterm babies included in the study were compared by their descriptive properties, it was found that the mean gestation age was 32.16 ± 1.19 weeks and the mean birth weight was 1619.46 ± 303.03 g in the spoon feeding group and the mean gestation age was 32.37 ± 1.00 weeks and the mean birth was 1704.43 ± 202.58 g in the bottle feeding group. When the preterm babies in the spoon feeding and bottle feeding groups were compared in terms of gender, gestational age, birth weight, height and head circumference and Apgar scores at the 1st and 5th minutes, no statistically significant difference was found between the groups ($p > 0.05$, Table 1).

In the spoon feeding group, the mean weight at the time of starting breastfeeding was found to be 1859.16 ± 201.94 g, the mean weight at the time of switching to full breastfeeding was found to be 1965.24 ± 187.45 g and the mean weight at the time of discharge was found to be 2106.03 ± 105.51 g. In the bottle feeding group, the mean weight at the time of starting breastfeeding was found to

be 1930.28 ± 142.51 g, the mean weight at the time of switching to full breastfeeding was found to be 2039.00 ± 270.72 g and the mean weight at the time of discharge was found to be 2131.88 ± 234.77 g. It was found that there was no significant difference between the two groups in terms of the mean weight at the time of starting breastfeeding, at the time of switching to full breastfeeding and at the time of discharge ($p > 0.05$, Table 2).

In the study, it was found that the mean time to switch to full breastfeeding from the time of the first breastfeeding was 104.43 ± 72.66 hours and the mean time for discharge was 140.11 ± 107.41 hours in the preterm babies in the spoon feeding group. In the bottle feeding group, the mean time to switch to full breastfeeding from the time of the first breastfeeding was found to be 148.91 ± 109.84 hours and the mean time for discharge was found to be 164.91 ± 123.38 hours. It was found that the times to switch to full breastfeeding in the preterm babies in the spoon feeding group were significantly shorter ($p < 0.05$) and there was no difference between the mean times from the first breastfeeding to discharge ($p > 0.05$, Table 3).

Table 1. Comparison of the spoon feeding and bottle feeding groups according to the descriptive properties of preterm babies

Properties	Spoon feeding Gr (n=37) Mean±SD		Bottle feeding Gr (n=35) Mean±SD		Test and p
Gender*					
Male	23	62.2	18	51.4	$\chi^2=0.845$
Female	14	37.8	37	48.6	$p=0.358$
Gestational age (weeks)	32.16 ± 1.19		32.37 ± 1.00		$t=0.804$ $p=0.424$
Birth weight	1619.46 ± 303.03		1704.43 ± 202.58		$t=1.391$ $p=0.169$
Height (cm)	41.05 ± 2.69		41.80 ± 2.37		$t=1.240$ $p=0.219$
Head circumference (cm)	29.35 ± 1.64		29.86 ± 0.69		$t=1.690$ $p=0.095$
APGAR at the first minute	7.14 ± 0.42		7.29 ± 0.46		$t=1.456$ $p=0.150$
APGAR at the fifth minute	8.11 ± 0.74		8.25 ± 0.51		$t=0.995$ $p=0.323$

*n, %; SD: standard deviation

Table 2. Comparison of the groups in terms of mean weights at the time of starting breastfeeding, at the time of switching to full breastfeeding and at the time of discharge

Properties	Spoon feeding Gr (n=37) Mean±SD	Bottle feeding Gr (n=35) Mean±SD	Test and p
Weight at the time of starting breastfeeding (g)	1859.16±201.94	1930.28±142.51	t=1.718 p=0.090
Weight at the time of switching to full breastfeeding (g)	1965.24±187.45	2039.00±270.72	t=1.363 p=0.177
Weight at the time of discharge (g)	2106.03±105.51	2131.88±234.77	t=0.608 p=0.545

SD: standard deviation

Table 3. Comparison of the groups in terms of mean weights at the time of switching to full breastfeeding and at the time of discharge

Properties	Spoon feeding Gr (n=37) Mean±SD	Bottle feeding Gr (n=35) Mean±SD	Test and p
The period between the first breastfeeding and the time of switching to full breastfeeding (hours)	104.43±72.66	148.91±109.84	t=2.037 p=0.045
The period between the first breastfeeding and the time of discharge (hours)	140.11±107.41	164.91±123.38	t=0.911 p=0.365

SD: standard deviation

When the mean scores of the LATCH Breastfeeding Assessment Tool were compared between the spoon feeding group and bottle feeding group, it was found that as the sucking experience of the preterm babies in both groups increased, the scores for sucking success gradually increased. However, when the mean scores for sucking success which were evaluated at different nursing meals were compared between the groups, it was found that there was no difference between the groups in the first measurement ($p>0.05$), while there as a significant difference in favour of the spoon feeding group in the second and final measurements ($p<0.05$, Table 4).

Discussion

Breastmilk is a unique source which provides growth, meets the requirement for nutritional elements and supports normal development of the orofacial structures for SGA and preterm babies (3, 7, 17, 18). For preterm babies to survive and become healthy in a short time feeding by gavage should be discontinued as soon as possible and oral feeding should be started when the coordination of sucking, swallowing and breathing occurs. When preterm babies are ready for oral feeding, it is recommended that oral feeding should be started by direct breastfeeding (3-7, 19). However, preterm babies are not successful in breastfeeding at their first experience. Therefore, supportive feeding methods accompany breastfeeding in this period (3, 8).

Table 4. Comparison of the groups in terms of the mean scores of the LATCH assessment tool

Properties	Spoon feeding Gr (n=37) Mean±SD	Bottle feeding Gr (n=35) Mean±SD	Test and p
First measurement LATCH	6.59±1.34	6.74±1.09	t=0.512 p=0.610
Second measurement LATCH	8.29±1.54	7.54±1.46	t=2.127 p=0.037
Final measurement LATCH	9.83±0.55	9.22±0.54	t=4.695 p=0.000

SD: standard deviation

The fact that preterm babies had similar body weights at the time of starting breastfeeding in this study may be related with occurrence of sucking behavior at similar maturational periods in preterm babies in both neonatal intensive care units where the study was conducted. Since nutrition plans are made by calculating nutritional requirements of preterm babies in neonatal units, it was found that the mean body weight values were similar at the time of switching to full breastfeeding in the babies in both groups. The fact that the weights of the preterm babies in the spoon feeding and bottle feeding groups were similar at the time of discharge may be related with inclusion of body weight in the criteria for discharge for preterm babies in both neonatology units.

When we examined the national and international literature, we could not find any study which compared spoon feeding and bottle feeding methods which are used as supportive feeding methods in addition to breastfeeding in preterm babies. There are many studies related with bottle feeding in the literature (7, 10, 11, 13, 20-23). Among these studies, some report the benefits of using bottle feeding as a supportive method, while many studies report the negative effects of bottle feeding on the health of preterm baby and its properties which remove babies from breastfeeding (7, 10, 11, 13). These studies do not recommend bottle feeding as a supportive feeding method in preterm babies and advise other methods. In addition, it has been stated that bottles which provide constant flow prevent development of sucking ability of preterm babies (7). Developed countries emphasize pot feeding or similar methods to protect babies from the negative effects of bottles on the health of preterm babies and from nipple confusion (10). Very few studies give information about spoon feeding as a supportive feeding method (11, 23-25). Hoover (24), Dowling and Thanattharakul (11) recommended spoon feeding in their study. Nair (23) reported that spoon feeding could be used as an option for bottle feeding or feeding by gavage in SGA and preterm babies which developed coordination of sucking, swallowing and breathing and use of spoon feeding in the hospital setting provided earlier discharge and faster weight gain. The results of our study are similar to the results of previous studies.

In the study, it was found that there was no significant difference between the groups in terms of the period from the first breastfeeding experience to the time of discharge. It is thought that this is related with the fact that nutritional treatment was adjusted according to daily nutritional requirement for preterm babies in both neonatology units and body weight was considered for discharge.

In the study, it was found that the sucking success rates evaluated 24 hours after the first breastfeeding experience and before discharge in preterm babies in the spoon feeding group were statistically significantly higher compared to the bottle feeding group. Studies conducted before reported that use of bottle

feeding in babies affected breastfeeding outcomes negatively by leading to nipple confusion (10, 20, 23, 25-27). With use of bottle as a supportive method, preterm babies confuse bottle-nipple with their mothers' nipple and prefer bottle-nipple which is more convenient and they remove from breastfeeding (25). Savaşer (3) reported that bottle-fed babies showed more physiological stress signs compared to breastfed babies and coordination for sucking, swallowing and breathing occurred earlier in breastfed babies. Similarly, studies have found that oxygen saturation is lower in bottle-fed babies compared to breast-fed babies (21, 28-30). Studies have reported that spoon feeding and pot feeding are techniques which can be used as supportive methods in addition to breastfeeding and which prevent nipple confusion (23, 31, 32). The findings of our study are compatible with the literature.

As a result of our study, spoon feeding which is a convenient, hygienic and non-invasive technique providing weight gain and which does not remove the baby from breastfeeding can be recommended as a supportive feeding method for preterm babies until they reach the maturation level where they can meet their nutritional requirements by way of breastfeeding. In addition, it is recommended that experimental studies related with supportive feeding methods should be conducted with large sample groups and the effects of these methods on the health status of preterm babies should be elucidated.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Atatürk University Health Sciences Faculty (05.08.2013).

Informed Consent: Written informed consent was obtained from the parents of the patients.

Peer-review: Externally peer-reviewed.

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